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SCORCHED TREES AND THEIR TREATMENT.

A. Sharples.

THE years 1914-15 were noteworthy in Malaya for a very heavy fall of leaves during the wintering period. In ordinary seasons the wintering of the trees in the plantations is a very gradual affair, extending over some three months—December-February. The earlier wintering trees may have regained a new flush, while adjacent trees are just beginning to throw off their leaves. Numbers of trees may retain their leaves during the wintering period. Thus, the wintering on the plantations takes place with much irregularity; there is little comparison with the regular and very definite wintering which is associated with the change of seasons in temperate climates.

The wintering periods of 1914-15 in the rubber plantations of Malaya were more regular than in previous years—*i.e.*, more concentrated in time, and whole estates were quite devoid of leaves on their trees for short periods. The fallen leaves formed a thick layer on the ground, and as the leaf-fall period coincides with one of dry weather—February is usually a dry month—the dead dry leaves become very inflammable. Estates situated alongside the railway are very liable to leaf fires, the sparks from the engines being quite sufficient to set the fallen leaves alight. Once started the fire passes with amazing rapidity over large areas, scorching the trunks up to a height of sometimes ten feet. Usually the fire is so rapid that only the surface is scorched; there is no burning of the deeper cortical tissues.

If left untreated, boring beetles are quickly at work and begin to enter the tree through the scorched surfaces. The insects are followed by the fungus *Ustulina zonata—see* Bulletin No. 25, Department of Agriculture. The insects have been observed at work on scorched trees three days after the fire was put out. If immediate steps are not taken, the insects multiply rapidly and large numbers of trees may be lost. Several estates in 1914-15 lost several acres of rubber owing to leaf fires.

Preventive measures should start immediately the fire has passed, as soon as the coolies can begin working in the burnt areas. All possible labour and supervision should be concentrated on treating the trees rapidly, for once the insects get well into the wood there is little hope of saving the trees. For the purposes of treatment, trees damaged by fire can be divided into two groups: (*a*) burnt or badly scorched trees; (*b*) slightly scorched trees.

(*a*) The cortical tissues of these trees are so badly damaged that treatment involves the removal of the whole of the bark so as to expose the wood. The whole of the burnt tissue should be cut out and the exposed wood surfaces coated with a mixture of tar and crude oil, 80 per cent.-20 per cent. A second coating should follow the first after a few days' interval, and the trees should be inspected regularly, an extra coat being given when necessary. If the bark is burnt to such an extent that treatment necessitates "ringing"—*i.e.*, if a complete ring of bark has to be removed, then the tree should be taken out immediately.

(*b*) Only the outer cortical tissues are damaged by fire in this group. The burnt tissues should be scraped away with a blunt instrument such as a piece of hoop iron, until healthy tissues are exposed; the exposed surface should then be painted with the tar mixture as recommended above.

If the treatment is thoroughly carried out the slightly scorched trees should fully recover. The treated surfaces of badly scorched trees will never be tappable again, but one side of the tree is saved. The treatment prescribed is only serviceable for trees above seven years old; below this age the trees might, with advantage, be taken out immediately and the area re-planted. On two occasions the treatment recommended has proved successful. A case has come to my knowledge where similar treatment carried out on one estate was unsuccessful. It has not been possible to gain further information about the case, but I should ascribe the failure either to (*a*) insufficient tarring, or (*b*) not getting to work quickly enough. Failure to meet either of these conditions would allow the insects to get well into the wood.

The treatment of scorched trees is important with reference to the spread of the fungus *Ustulina zonata* about the plantation. As indicated above, the great majority of trees badly attacked by borers show the presence of this fungus in the wood. The fructifications are formed on the surface of the attacked areas, and numberless spores are blown about the plantations. If these find a convenient resting place at the collar of the permanent trees, they germinate and attack the tissues of the root and collar. All bored trees showing the typical symptoms of *Ustulina zonata* should be cut out and immediately destroyed.

SEEDING OF HEVEA AT DIFFERENT ALTITUDES ON GUNONG ANGSI.

By F. G. Spring.

OBSERVATIONS have been made, during the present season, on seed production at different altitudes. The information was collected from several plots of rubber on Gunong Angsi which were planted up in April, 1905, for the purpose of attempting to test the effect of climatic conditions on the growth of the tree and afterwards the yield of rubber at different elevations.

In previous articles (*Agricultural Bulletin*, F.M.S. Vol. 1, page 154, and Vol. 11, page 119) it has been shown that the growth of the tree and yield of rubber are poor at a comparatively high altitude as compared with that obtained at lower elevations, and it would appear that seed production is also affected as will be seen from the following :

No. of plot.	Elevation.	No. of trees in tapping.	Date when tapping commenced.	* Average girth in December, 1911.	Seed production.
1	300 feet.	366	August, 1911	25·07 ins.	Normal
2	600 „	124	June, 1912	16·29 „	„
3	1,000 „	369	August, 1911	21·83 „	Slight reduction
4	1,200 „		Not Planted		
5	1,600 „	50	June, 1912	17·86 „	Noticeable „
6	1,800 „	40	June, 1912	16·89 „	Approximately 100 seeds per area
7	2,100 „	40	June, 1914	12·09 „	Approximately 15 seeds per area
8	2,400 „	67	June, 1914	14·21 „	Nil.

* Measured three feet from the base of the tree.

At about 1,000 feet the yield of seed commences to fall off, at 1,800 feet only a few seeds were produced, while at 2,400 feet there was no evidence of fruiting. The seeds collected from plots Nos. 6 and 7 (1,800 feet and 2,100 feet) are smaller and have not the dark, rich colour of the seeds in the lower fields. Nursery beds have been planted up with seeds from the respective plots and it is proposed to make a comparison of the resulting seedlings and later growth. The cause or causes of this inability to produce seed is not yet known but during the next fruiting season further observations will be made and it is hoped that some explanation will be forthcoming.

ADDITIONS TO CATALOGUE OF PLANT NAMES.

Contained in the Public Gardens, Kuala Lumpur, Federated Malay States.

By J. N. Milsum.

IN the *Agricultural Bulletin*, F.M.S., Vol. III, Nos. 9 and 10, a catalogue was published comprising the majority of the plants growing in the Public Gardens, Kuala Lumpur, at that time.

During the past year various new species have been introduced into the Gardens, and others previously unnamed have since been identified. It is thought, therefore, that a list of these additions may be of interest.

As in the former catalogue, Bentham and Hooker's arrangement has been followed for the Dicotyledons, but the genera of the Monocotyledons have been arranged alphabetically.

Dicotyledons.

MAGNOLIACEÆ.

Michelia, L.

Michelia montana, *Bl.* Tree, Ornament and scent, Malaya.
White Champac.

CRUCIFERÆ.

Matthiola, Br.

Matthiola coronopifolia, *D. C.* Annual, Ornament, Mediterranean region.

VIOLACEÆ.

Viola, Tourn.

Viola odorata, *L.* Herb, Ornament, Europe.
Sweet Violet.

GUTTIFERÆ.

Calophyllum, L.

Calophyllum inophyllum, *L.* Tree, Oil and drug, E. Indies.
Penanga.

Calophyllum macrocarpum, *Hook, f.* Tree, Ornament, Malaya.

DIPTEROCARPEÆ

Dryobalanops, Gaertn.

Dryobalanops aromatica, *Gaertn.* Tree, Timber and Camphor, Malay Arch.
Malay Camphor.

MALVACEÆ.

HIBISCUS, L.

Hibiscus collinus, *Roxb.* Shrub, Ornament, India.

Hibiscus radiatus, *Cav.* Fl. Shrub, Ornament, Cochin-China.

BOMBAX, L.

Bombax insigne, *Wall.* Tree, India.

STERCULIACEÆ.

STERCULIA, L.

Sterculia Scaphigera, *Wall.* Tree, Edible fruit, Malaya.
Kembang Samangko.

GERANIACEÆ.

IMPATIENS, L.

Impatiens Hawkeri, *Bull.*

RUTACEÆ.

TRIPHASIA, Lour.

Triphasia aurantiola, *Lour.* Shrub, Edible fruits, Trop. Asia.
Lime Berry.

BURSERACEÆ.

CANARIUM, L.

Canarium commune, *L.* Tree, Medicinal, Malaya.
Java Almond.

MELIACEÆ.

SWIETENIA, L.

Swietenia macrophylla, *King.* Tree, Timber, S. America.

SAPINDACEÆ.

NEPHELIUM, L.

Nephelium maliense, *Griff.* Tree, Edible fruit, Malaya.
Mata Kuching.

Nephelium Litchii, *Camb.* Tree, Edible fruit, China.
Litchii.

LEGUMINOSÆ.

WISTARIA, Nutt.

Wistaria chinensis, *Nutt.* Fl. Climber, Ornament, China and Japan.

ERYTHRINA, L.

Erythrina lithosperma, *Blume.* Tree, Ornament, Burma and Malaya.
Dadap.

DALBERGIA, L.

Dalbergia lanceolaria, *L.* Tree, Ornament, India.

DERRIS, Lour.

Derris elliptica, *Benth.* Climbing Shrub, Drug, Burma and Malaya.

Tuba Root.

HAEMATOXYLON, L.

Haematoxylon campechianum, *L.* Tree, Timber, T. America.

Logwood.

CASSIA, L.

Cassia nodosa, *Buch-Ham.* Fl. Tree, Ornament, T. Asia.

TAMARINDUS, L.

Tamarindus indica, *L.* Tree, Edible fruit, Asia.

Tamarind.

HYMENAEA, L.

Hymenaea courbaril, *L.* Tree, Timber, S. America.

Gum Animi.

ACACIA, L.

Acacia decurrens, *Willd.* Tree, Australia.

ALBIZZIA, Dur.

Albizzia stipulata, *Boiv.* Tree, Timber, E. Indies.

PITHECOLOBIUM, Mart.

Pithecolobium Unguis-cati, *Benth.* Tree, Trop. America.

CRASSULACEÆ.

BRYROPHYLLUM, Salisb.

Bryrophyllum calycinum, *Salisb.* Shrub, T. Africa and Asia.

MYRTACEÆ.

EUCALYPTUS, L'Herit.

Eucalyptus citriodora, *Hook. f.* Tree, Timber, Australia.

Eucalyptus globulus, *Lab.* Tree, Timber, Australia.

Blue Gum.

Eucalyptus bicolor. *A. Cunn.* Tree, Timber, Australia.

Eucalyptus microtheca, *F. Muell.* Tree, Timber, Australia.

Eucalyptus melanophloia, *F. Muell.* Tree, Timber, Australia.

Eucalyptus crebra, *F. Muell.* Tree, Timber, Australia.

Eucalyptus rostrata, *Schl.* Tree, Timber, Australia.

Eucalyptus populifolia, *Hook.* Tree, Timber, Australia.

MELASTOMACEÆ.

MELASTOMA, L.

Melastoma malabathricum. *L.* Fl. Shrub, India and Malaya.

PASSIFLOREÆ.

PASSIFLORA, L.

Passiflora vitifolia, *H. B. K.* Climber, Ornament, Brazil.

CUCURBITACEÆ.

TRICHOSANTHES, L.

Trichosanthes anguina, *L.* Climber, Edible fruit, Tropics.
Snake Gourd.

RUBIACEÆ.

RONDELETIA, L.

Rondeletia odorata, *Jacq.* Fl. Shrub, Ornament, Mexico.

RANDIA, L.

Randia macrantha, *D. C.* Fl. Shrub, Ornament, T. Africa.

EBENANCEÆ.

DIOSPYROS, L.

Diospyros sp. Tree, Ornament, Malaya.

OLEACEÆ.

JASMINUM, L.

Jasminum Maingayi, *Clarke.* Shurb, Ornament, Penang.

APOCYNACEÆ.

ROUPELLIA, Wall.

Roupellia grata, *Wall.* Fl. Shrub, Ornament, T. Africa.

CONVOLVULACEÆ.

IPOMAEA, L.

Ipomaea Bona-nox, *L.* Fl. Climber, Ornament, S. America.
Moonflower.

GESNERACEÆ

ACHIMENES, P. Br.

Achimenes grandiflora, *D. C.* Tubers, Ornament. S. America.

BIGNONIACEÆ.

BIGNONIA, L.

Bignonia venusta, *Ker-Gawl.* Fl. Climber, Ornament, Brazil.

TECOMA, Juss.

Tecoma stans, *Juss.* Fl. Shrub, Ornament, S. America.

TABEBUIA, Gomez.

Tabebuia spectabilis. Fl. Tree, Ornament, W. Indies.

ACANTHACEÆ.

ERANTHEMUM, L.

Eranthemum reticulatum, *Hort.* Shrub, Ornament, Polynesia.

DAEDALACANTHUS, T. Anders.

Daedalacanthus nervosus, *T. Anders.* Shrub, Ornament, India.

VERBENACEÆ.

VERBENA, L.

Verbena Garden hybrid. Fl. Herb, Ornament, America.

STACHYTARPHETA, Vahl.

Stachytarpheta indica, *Vahl.* Herb, Cos., Tropical.

CLERODENDRON, L.

Clerodendron Minhassae, *T. and B.* Shrub, Ornament, Celebes.

LABIATÆ.

ORTHOSIPHON, Benth.

Orthosiphon stamineus, *Benth.* Herb, Plant, Ornament, Trop. Asia.

Goat's Beard.

SALVIA, L.

Salvia farinacea, *Benth.* Annual, Ornament, Texas.

Salvia patens, *Cav.* Annual, Ornament, Mexico.

ARISTOLOCHIACEÆ.

ARISTOLOCHIA, L.

Aristolochia elegans, *Mast.* Fl. Climber, Ornament, Brazil.

LORANTHACEÆ.

LORANTHUS, L.

Loranthus ampullaceus, *Roxb.* Parasite, Malaya.

EUPHORBIACEÆ.

PEDILANTHUS, Neck.

Pedilanthus tithymaloides, *Poit.* Shrub, Ornament, S. America.

EUPHORBIA, L.

Euphorbia fulgens, *Kouv.* Fl. Shrub, Ornament, Mexico.

PHYLLANTHUS, L.

Phyllanthus myrtifolius, *Moon.* Fl. Shrub, Ornament, Ceylon.

Phyllanthus pulcher, *Wall.* Fl. Shrub, Ornament, Malaya.

JATROPHA, L.

Jatropha integemina, *Jacq.* Fl. Shrub, Ornament, Tropics.

URTICACEÆ.

ARTOCARPUS, Forst.

Artocarpus polyphemia, *Pers.* Tree, Edible fruit, Malaya.

Chempedak.

Artocarpus rigida, *Bl.* Tree, Edible fruit, Malaya.

Monkey Jack.

Gymnospermæ.

CONIFERÆ.

PINUS, L.

Pinus Australis. Tree, Ornament.

Pinus longifolia, *Roxb.* Tree, Ornament, Himal.

Monocolyledons.

ORCHIDEÆ.

ARUNDINIA, Bl.

Arundinia revoluta, *Hook, fl.* Terrestial, Perak.

BULBOPHYLLUM, Thow.

Bulbophyllum patens, *Hook, fl.* Epiphyte, Malaya.

CYMBIDIUM, Sw.

Cymbidium acutum *Ridl.* Epiphyte, T. Asia.

Cymbidium Finlaysonianum, *Lindl.* Epiphyte, Malaya.

DENDROBIUM, Sw.

Dendrobium aegle, *Ridl.* Epiphyte, T. Asia.

Dendrobium crumenatum, *Sw.* Epiphyte, T. Asia.
Pigeon Orchid.

RENANTHERA, Lour.

Renanthera arachnites, *Lind.* Epiphyte, Malaya.

Renanthera Maingayi, *Ridl.* Epiphyte.

Renanthera alba, *Ridl.* Epiphyte, Malaya.

DISTRIBUTION OF PINK DISEASE BY MUKIMS.

THE following list of mukims in which Pink Disease (*Corticium salmonicolor*) is or has been known to occur is compiled from information furnished by the Assistant Agricultural Inspectors for each State at the request of the Advisory Committee. Under the heading "Age of infection" the term "new" means that cases have been reported to this department within the last two years, "old" means that cases have been known for more than two years. Using this list as a basis of comparison it is proposed to publish lists at intervals showing the progress of or diminution of the disease in each mukim. It is hoped that the list will serve to show planters on estates still free from the disease if there is danger of their estates becoming infected at an early date or if this danger is still remote. The date of the list is 31st May, 1916.

PERAK.

KRIAN DISTRICT.

Mukim.	Intensity of infection.	Age of infection.
Parit Buntar	Slight	... New
Kuala Kurau	„	... „
Bagan Serai	Medium ...	... „
Brieh	Bad	... Old
Gunong Semanggol ...	„	... „
Selinsing	Medium ...	... „

LARUT AND MATANG DISTRICTS.

Sungei Tinggi ...	Medium ...	... Old
Trong	Bad	... „
Sungei Limau ...	Medium ...	... „
Simpang	„ ...	... „
Bukit Gantang ...	„ ...	... „
Jebong	„ ...	... „
Pengkalen Aor ...	„ ...	... „
Tupai	„ ...	... „
Kamunting	Bad	... „
Assam Kumbang ...	„	... „
Batu Kurau	„	... „

SUB-DISTRICT OF SELAMA.

Ulu Ijok	Slight... ...	... New
Selama	Bad	... Old
Ulu Selama	Medium ...	... „

Upper Perak District.

Mukim.	Intensity of infection.	Age of infection.
Blukar Semang	No report	
Belum	„	
Kroh	„	
Krunai	Slight	New
Temengoh	„	„
Grik	Medium	„
Kenering	Slight	„
Temelong	Medium	Old
Lenggong	„	„
Durian Pipit	„	„

Kuala Kangsar District.

Pulau Kamiri	Bad in places	Old
Chegar Galah	Medium	„
Kota Lama Kiri	„	„
Kota Lama Kanan	„	„
Saiong	„	„
Lubu Merbau	„	„
Kampong Buaya	„	„
Senggang	Slight	New
Blanja	„	„
Laiang Laiang	„	„
Bota	„	„
Lambor	„	„

Kinta District.

Sungei Trap	One case in 1915. None since

Batang Padang District.

Chenderiang	Slight	New
Batang Padang	Bad	Old
Bidor	„	„
Sungkai	„	„
Slim	„	„
Ulu Bernam	„	„

Lower Perak District.

Changkat Jong	Slight	New
Sungei Durian	„	„
Durian Sebatang	„	„

The mukim of Sitiawan and those up river are said to be slightly infected but a reliable inspection has not yet been made.

SELANGOR.

Ulu Selangor District.

Mukim.	Intensity of infection.	Age of infection
Ulu Bernam	Bad but improving ...	Old
Kalumpang	Less bad than formerly	,,
Kerling	Slight	New
Ampang Pechah ...	Moderate	,,
Rasa	A few cases	,,
Batang Kali	Moderate	Old
Ulu Yam	Bad	,,
Serendah	Moderate to slight ...	New
Rawang	A few cases only ...	,,

Kuala Selangor District.

Batang Berjuntai ...	A few cases only ...	New

Ulu Langat District.

Kajang	Slight	New
Semenyih	Moderate to slight ...	,,
Beranang	Slight	,,

THE NEGRI SEMBILAN.

Seremban District.

Seremban	Medium on eastern border	Uncertain
Rasah	Slight many months ago	New
Pantai	Very slight	,,
Labu	From bad in parts to medium and slight in others	Old

Jelebu District.

Kuala Klawang ...	Slight and scattered	New
Peradong	Slight to medium ..	,,
Pertang	Medium	Old

Kuala Pilah.

Ulu Muar	Slight formerly, but free on last inspection	New
Kuala Jempol ...	Formerly slight, but treated and now free for several months	,,

TAMPIN.

Mukim.	Intensity of infection.	Age of infection.
Chembong	Now practically free, infection only slight	New
Pedas ...	Medium near Seremban border to slight elsewhere	„

PAHANG.

RAUB DISTRICT.

Bentong	Slight	New
Semantan Ulu ...	„	„

KUALA LIPIS DISTRICT.

Gua	Slight	New
Punjom	„	„
Cheka	„	„

TEMERLOH DISTRICT.

Perak	A few cases	New

KUANTAN DISTRICT.

Kuantan	Slight	New

In this State the distribution of Pink Disease is not fully known.

JOHORE.

SEGAMAT DISTRICT.

Four estates, slight to moderate ...	....	New

MUAR DISTRICT.

One estate, one case ...	... ...	New

KOTA TINGGI DISTRICT.

One estate, well under control	... ...	Old

LATERITE AND ITS FORMATION.

LATERITE is the name given to a superficial rock formation characteristic of tropical countries. Although it has a very wide distribution and is formed from very variable rock formations it exhibits a remarkable uniformity in its characteristics. In composition it consists almost entirely of insoluble metallic oxides and is characterised by an absence of combined silica.

It is the product to which all rocks in tropical countries in which the rainfall continuously exceeds the evaporation, tend to be ultimately converted. In this country most of the soils, except the recent alluvial coastal clays and certain sandstone formations, are lateritic in character to a greater or less degree, although for various reasons the ultimate pure laterite consisting of nothing but hydrated metallic oxides is practically never reached.

All rocks consist mainly of free silica (quartz), silica combined with oxides of iron, aluminium, magnesium, calcium, potash, and soda, and sometimes calcium carbonate. A sandstone or quartzite may consist of practically nothing but pure silica, and a limestone of little but calcium carbonate. Such rocks cannot of course form laterite. The majority of rocks, however, do contain silica combined with varying proportions of metallic oxides. In temperate countries, when such rocks decompose, the oxides are removed in solution, silica combined with aluminium oxide and water remains. This is hydrated silicate of alumina or clay. In countries of high temperature this does not, however, occur, the oxides of soda, potash and calcium are removed as before, but the intense solvent action also results in the removal of the combined silica leaving behind the insoluble oxides of aluminium and iron which in combination with water form the product which we know as laterite. Neither pure clay or pure laterite can be a fertile soil.

The importance of lateritic formation from an economic point of view is that it results in the removal from the surface soil of those substances which are useful to the plant. This washing out which occurs in our lateritic hill soils is the reason for the poverty in chemical composition of these soils compared with those of temperate countries. Two factors are operative in retarding their entire exhaustion. Firstly, the formation of secondary compounds rich in silica less easily decomposed than the original rock, and secondly, a factor which is very potent in this country, the absorption of the soluble substances by the humus formed from the dense tropical vegetation. The retention of the humus of the soil is therefore most important in maintaining the fertility of the soil. Yet when *bukit* land is opened up for cultivation the humus is the first thing to disappear,

being quickly decomposed and washed out from the bare unprotected soil. Where no cover crop is grown and no measures are taken to prevent wash not only is much of the surface soil removed *in toto* but the process of laterisation and therefore ultimate infertility vastly accelerated. It is not until the crop covers the ground that this process is retarded. To this cause may be attributed the well known poverty of previously cultivated soils on which rubber is planted, and an explanation is offered of the good results which can be obtained by the application of organic manures to these soils.

The question of the formation of lateritic soil in Java and Sumatra was recently fully dealt with in a "Report on Certain Aspects of the Tea Industry of Java and Sumatra" by G. D. Hope, Scientific Officer to the Indian Tea Association.

J. G.

PASSIFLORA LAURIFOLIA.

THIS handsome West Indian perennial climber appears to have been introduced into the East during the early part of the last century.

P. laurifolia may be distinguished from the other species of passion flowers by its laurel-like foliage and orange-yellow fruits. It makes a very decorative climber when grown over a trellis or as a screen for the sides of plant houses.

The fruit, which are produced in great abundance, are about the size of a hen's egg and contain a quantity of sweet watery pulp. This pulp is very palatable and may be eaten in a variety of ways. The rind is thin and smooth and is not eaten as in the case of *P. quadrangularis*.

A number of plants growing over low frames in the Kuala Lumpur Experimental Plantations have, during the past year, produced large quantities of fruit. In Ceylon it is said not to fruit, and doubts are expressed in that quarter as to its fruiting at all in the East. The plant grows well at low elevations and does not appear to require other than ordinary soil, providing a little well-rotted cow manure be worked round its roots.

P. laurifolia may be propagated either from seed or cuttings, but requires to become well established before fruiting.

Seeds or cuttings can be supplied, to those interested in the cultivation of this fruit, upon application to the Director of Agriculture, Federated Malay States.

J. N. M.

Exports of Rubber from British Malaya (other than the F.M.S.).

State.	Month.	Quantity.
		lbs.
Johore	July, 1916 ...	2,505,785
Kelantan	June-July, ,, ...	347,638
Kedah	,, ,, ...	664,265
Perlis	,, ,, ...	657
British N. Borneo ...	July ,, ...	356,462
Brunei	,, ...	7,522

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected thereon, during the years 1916 and 1915.

Destination.	Exported during July, 1916.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1916.	Duty collected, 1916, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	$	$ c.
Straits Settlements ...	3,998.15	19,346.95	23,345.10	14,969.29	8,375.81	...	61,493,779	
United Kingdom ...	818.88	6,794.15	7,613.03	7,401.81	211.22	...	20,519,010	
Continent of Europe ...	...	...	...	8.00	...	8.00		
Ceylon	...	408.60	408.60	402.85	5.75	...	1,142,545	
Other Countries ...	235.66	542.49	778.15	95.07	683,08	...	1,912,475	
Total ...	5,052.69	27,092.19	32,144.88	22,877.02	9,275.86	8.00	85,067,809	2,215,677 53

KUALA LUMPUR,
9th August, 1916.

E. BURNSIDE,
Acting Commissioner, Trade and Customs, F.M.S.

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected thereon, during the years 1916 and 1915.

Destination.	Exported during August, 1916.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1916.	Duty collected, 1916, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	$	$ c.
Straits Settlements ...	4,075.80	23,345.10	27,420.90	17,577.14	9,843.76	...	68,830,367	
United Kingdom ...	1,425.54	7,613.03	9,038.57	8,531.80	506.77	...	23,085,068	
Continent of Europe ...	...	...	...	8.00	...	8.00		
Ceylon	56.32	408.60	464.92	461.09	3.83	...	1,243,917	
Other Countries ...	224.08	778.15	1,002.23	95.07	907.16	...	2,315,859	
Total ...	5,781.74	32,144.88	37,926.62	26,673.10	11,261.52	8.00	95,475,211	2,487,477 14

KUALA LUMPUR,
6th September, 1916.

E. BURNSIDE,
Acting Commissioner, Trade and Customs, F.M.S.

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected thereon, during the years 1916 and 1915.

Destination.	Exported during September, 1916.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1916.	Duty collected, 1916, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	$	$ c.
Straits Settlements ...	4,592.98	27,420.90	32,013.88	20,437.69	11,576.19	...	77,484,625	
United Kingdom ...	1,662.56	9,038.57	10,701.13	9,613.01	1,088.12	...	26,217,703	
Continent of Europe ...	Nil	...	Nil	8.00	...	8.00	...	
Ceylon	88.06	464.92	552.98	503.82	49.16	...	1,409,849	
Other Countries ...	32.81	1,002.23	1,035.04	95.07	939.97	...	2,377,684	
Total ...	6,376.41	37,926.62	44,303.03	30,657.59	13,653.44	8.00	107,489.861	2,798,590.53

KUALA LUMPUR,
10th October, 1916.

E. BURNSIDE,
Acting Commissioner, Trade and Customs, F.M.S.

Comparative Return of Exports, F. M. S., during the second quarters, 1916 and 1915.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		1916 Total.		1915 Total.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
			$		$		$		$		$		$
Coconuts	Pikuls	...	...	...	116	...	34	...	30	...	180	...	1,541
Copra ...	,,	10,332	93,981	44,342	441,397	162½	1,626	250	2,500	55,086½	539,504	53,028	463,237
Coffee ...	,,	1,529	49,321	...	...	...	...	...	...	1,521	49,321	1,908¼	55,964
Padi ...	,,	...	...	31,264	66,039	1	3	...	...	31,265	66,042	31,319½	63,075
Rice ...	,,	...	...	47,437	216,523	...	...	...	...	47,437	216,523	56,110	237,317
Pepper ...	,,	...	...	...	...	16	347	...	...	16	347	81	1,638
Sugar ...	,,	...	1,609	10	140	...	...	...	...	10	1,749	5½	83
Tapioca	,,	...	...	1,783	8,581	2,539	15,387	...	...	4,322	23,968	12,284	81,301
Gambier	,,	...	...	...	...	3,434	55,103	...	...	3,434	55,103	3,183	30,462

Comparative Return of Imports, F. M. S., during the second quarters, 1916 and 1915.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		1916 Total.		1915 Total.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
			$		$		$		$		$		$
Coconuts	Pikuls	...	8	...	120	...	99	...	...	...	227	..	1,953
Copra ...	,,	...	...	1½	14	...	...	...	...	1½	14	2 7/10	26
Coffee ...	,,	31¼	1,137	170⅛	6,820	9½	314	57	1,994	268¼	10,265	274½	6,630
Padi ...	,,	6,299	16,945	14,559	36,146	432	1,377	819	2,172	22,109	56,640	7,182½	17,235
Rice ...	,,	276,530	1,357,266	317,997	1,517,614	73,200	358,888	22,454	125,272	690,181	3,359,040	778,435	3,604,937
Pepper ...	,,	116	3,102	92½	2,415	11	262	...	...	219	5,779	302	8,039
Sugar ...	,,	11,131½	106,670	32,474½	302,436	4,482	43,637	1,674	17,024	49,726	469,767	44,915 9/10	363,769
Tapioca	,,	490½	2,456	1,356½	23,578	136¾	1,341	2	15	1,985¾	27,360	2,407½	20,304
Gambier	,,	29½	418	108	2,511	61	634	52	956	250½	4,519	264 7/10	3,895

Abstract of Meteorological Readings in the various Districts of Malaya for the month of July, 1916.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	134.	81.2	90.61	73.38	17.22	76.3	.812	73.0	76.	...	6.92	1.73
Pahang, Kuala Lipis	...	...	80.1	89.2	72.1	17.2	75.5	...	...	...	...	8.70	1.50
Johore, Johore Bahru	...	...	...	85.43	72.90	12.53	...	...	...	...	...	10.83	...
Singapore, Kandang Kerbau ...	29.817	151.5	81.3	86.2	73.8	12.04	77.2	.873	...	80.	...	...	1.98
Malacca, Durian Daun	29.801	137.8	80.6	85.3	70.3	15.	78.6	.931	...	90	N.E.	13.24	1.90
Negri Sembilan, Seremban ...	...	152.3	78.7	87.2	72.4	14.8	74.8	.789	73.2	81.0	N.W.	6.80	1.30
„ Kuala Pilah ...	...	141.3	81.1	90.1	73.6	16.6	79.1	.942	77.2	85.4	...	5.79	2.00
„ Port Dickson...	...	122.0	80.6	86.4	73.6	12.8	76.6	.841	73.9	80.5	...	17.21	2.00
Selangor, Kuala Lumpur ...	29.751	143.0	78.8	84.7	76.1	8.6	76.1	.846	74.2	85.	S.E.	12.26	1.90
„ Klang...	...	...	79.8	83.9	72.9	11.0	75.9	...	...	...	...	11.79	2.12
„ Kuala Selangor ...	...	...	...	87.7	74.0	15.7	...	...	...	...	...	11.68	2.46
„ Rawang	...	...	...	91.1	...	...	...	...	...	...	...	12.11	1.87
Perak, Telok Anson	...	...	80.72	91.	69.	22.	76.77	.869	...	85.	...	11.10	2.04
„ Ipoh	...	...	81.63	92.	70.	22.	76.39	.838	73.28	78.	...	12.28	1.77
„ Taiping	...	115.	80.12	92.	72.	20.	76.14	.851	...	85.	...	16.96	4.60
„ The Cottage	...	...	...	...	...	...	...	...	...	...	...	24.88	4.64
„ Parit Buntar	...	...	81.54	93.	70.	23.	77.13	.874	...	83.	...	7.71	2.00
Penang Georgetown	29.749	139.9	82.8	87.6	73.7	13.9	77.6	.878	75.4	78.	S.E.	16.22	4.90
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	21.71	4.78
Perlis, Perlis	...	...	...	86.45	73.38	31.13	...	...	...	...	...	15.10	5.72

Abstract of Meteorological Readings in the various Districts of Malaya for the month of August, 1916.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bharu	...	138.	81.7	90.48	72.96	17.51	76.4	·807	72.8	74.	...	5.17	1.48
Pahang, Kuala Lipis	...	...	80.8	87.4	71.8	15.6	74.5	...	...	...	...	6.87	1.81
Johore, Johore Bharu	...	...	...	86.79	73.08	13.71	...	...	...	...	...	10.69	...
Singapore, Kandang Kerbau ...	29.917	159.5	82.3	87.5	74.1	13.4	74.2	.869	...	79.	...	10.25	2.33
Malacca, Durian Daun ...	29.804	143.4	81.2	85.8	71.1	14.7	78.7	.945	...	88.	N.W.	14.89	2.36
Negri Sembilan, Seremban ...	...	154.5	78.2	88.3	70.5	17.7	75.3	.795	72.2	82.5	N.W.	7.41	1.90
„ Kuala Pilah ...	...	139.6	80.7	90.1	72.6	17.5	76.7	.852	74.2	81.1	...	6.67	.92
„ Port Dickson...	...	126.0	80.6	86.3	73.3	13.0	76.6	.841	74.0	80.8	...	16.45	2.53
Selangor, Kuala Lumpur ...	29.757	143.6	79.3	82.5	76.5	6.0	76.0	.834	73.7	82.	S.E.	6.94	1.31
„ Klang	...	...	79.5	83.6	72.9	10.7	75.9	...	...	...	...	7.88	1.61
„ Kuala Selangor ...	...	...	...	88.1	74.5	13.6	...	...	...	...	...	8.24	1.93
„ Rawang	...	...	...	93.2	...	...	...	...	...	...	...	6.69	2.37
Perak, Telok Anson	...	...	81.52	92.	70.	22.	77.13	.875	...	83.	...	7.16	1.85
„ Ipoh	...	...	82.26	93.	70.	23.	76.77	.848	74.57	78.	...	11.25	3.03
„ Taiping	...	113.	81.21	94.	72.	22.	76.70	.859	...	80.	...	11.73	2.59
„ The Cottage	...	...	...	...	...	...	...	...	...	...	...	20.35	2.51
„ Parit Buntar	...	...	82.67	93.	71.	22.	77.81	.889	...	81.	...	11.92	4.13
Penang Georgetown	29.791	142.8	82.1	88.8	72.8	16.	77.5	.872	...	79.	S.E.	2.65	1.10
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	16.39	7.32
Perlis, Perlis	...	...	...	87.03	73.97	13.06	...	..	...	...	...	7.07	6.05